In[37]:=
```
x0 = 0;
x1 = 1.0;
Nmax = 20;
eps = 0.0001;

f[x_] := Cos[x] - x * Exp[x];

Print["Secant Method Iterations:"];
Print["--------------------------------"];

For[i = 1, i ≤ Nmax, i++,

 fx0 = f[x0];
 fx1 = f[x1];

 If[fx1 - fx0 == 0,
  Print["Division by zero error. Method fails."];
  Break[];
 ];

 x2 = x1 - fx1*(x1 - x0)/(fx1 - fx0);

 error = Abs[x2 - x1];

 Print["Iteration ", i, ":  x = ", N[x2], ",   Error = ", N[error]];

 If[error < eps,
  Print["--------------------------------"];
  Print["Root found = ", N[x2]];
  Print["Stopped at iteration ", i];
  root = x2;
  Break[];
 ];

 x0 = x1;
 x1 = x2;
]

Print["--------------------------------"];
Print["Final Root = ", N[root]];

(* --- Graph Plotting --- *)
```

```
Print["Plotting f[x] ..."];

Plot[
 f[x], {x, -1, 3},
 PlotRange → {-2, 2},
 PlotStyle → {Red, Thick},
 AxesLabel → {"x", "f[x]"},
 PlotLabel → "f[x] = Cos[x] - x*Exp[x]"
]
```

```
Secant Method Iterations:
--------------------------------
Iteration 1:  x = 0.314665,   Error = 0.685335
Iteration 2:  x = 0.446728,   Error = 0.132063
Iteration 3:  x = 0.531706,   Error = 0.0849777
Iteration 4:  x = 0.516904,   Error = 0.0148014
Iteration 5:  x = 0.517747,   Error = 0.000842998
Iteration 6:  x = 0.517757,   Error = 9.90548 × 10^-6
--------------------------------
Root found = 0.517757
Stopped at iteration 6
--------------------------------
Final Root = 0.517757
Plotting f[x] ...
```

Out[48]=